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Outdoors in Georgia

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FRONT COVER: Little blue heron. See more coastal birds in "Birds of our Coastal Margin," beginning on page 7. Photo by Bob Busby.

BACK COVER: Winter's harshness is contrasted by the lacy outline of ice-covered trees. Photo by Bob Busby.

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Our Indian Heritage

In this issue of *Outdoors in Georgia,* we learn a great deal about one aspect of our state's Indian culture (see article, page 18). I think it is also likely that we can learn a lot from Georgia's rich Indian heritage. Earlier Georgians—the Cherokees and the Creeks—protected their environment. There is, for example, the Cherokee saying: "Never take from Mother Earth more than she can replenish."

Modern technological pollution was unknown in Georgia in the days when the Cherokee Nation flourished here, but to combat what that technology does to our world today, we have essentially returned to the Indian concept of rapport with Mother Earth, establishing a protective stance to conserve and guard her gifts.

The age-old requirement of environmental protection is, however, only one aspect of Georgia's Indian heritage. As Bill Hammack points out in this issue of the magazine, the Cherokee Nation attained its cultural heights in Georgia. Its capital was in Georgia. Its newspaper, the *Cherokee Phoenix,* the first American Indian newspaper, was published in Georgia. The *Phoenix* let the world know that the Cherokees had developed a written language, the first Western Hemisphere Indians to do so. Through the pages of the *Phoenix,* people throughout America, in England, France and Germany learned about the great cultural achievements of Sequoyah, who invented the Cherokee syllabary.

Most visible reminders of Georgia's inheritance from her Indian peoples are the singing names that flow through the state: the Chattahoochee; the Oostanaula in the north; the Kinchafoonee in the south.

Running far deeper of course than the beautiful names, Georgia's Indian heritage may help us, today's Georgians, find the means to live in harmony with our environment and perhaps even with ourselves.

David Crawshaw

ORIENTEERING

By Denis Lovell
Chief Interpretive Naturalist, Parks and Historic Sites

Photography by Bob Busby

The pair slowly approach the top of the wooded hilltops, peering carefully through the underbrush. After a few moments they confer quietly, consulting a small scrap of paper marked with figures and symbols representing roads, hills, streams and ridges.

"I still think it's over there," says the first, pointing east of the direction from which they had come. "We swung to the west when we came over that last ridge."

"But the map doesn't show two hilltops that close together. It's got to be here." The second begins walking slowly around the small, flat knoll, then, "Hey! We're not at the top yet. It goes up some more over here!"

What do these two explorers expect to find at the hilltop? Treasure? A secret hideout? Nothing quite so romantic. These are orienteerers using map and compass to search for control points on a 1.1 mile cross country course. They are nearing the end of the longest of five legs on this beginner's course. They are also discovering that the quickest time between two points is not always a straight line.

Together they sprint through the tangled cat briers and grape vines to the true hilltop and see a red and white marker hanging from a low limb. Puffing from the unaccustomed exercise, they walk the last few steps to their goal as it spins slowly in the breeze. The first hands a card to the second. "Here, you punch the card while I set the azimuth for the next control point."

"No way. You almost got us lost on the last leg of the course. We'll both set the azimuth on the next one." After the card is punched, the two peer over their compasses, compare findings and plunge down the hillside toward the next red and white marker about 300 yards away.

At the bottom of the hill they stand on the bank of a small stream. A quick visual exchange seals the agreement to wade across the ten foot wide water rather than search for a bridge or narrow place. Once across, they are faced with a thick growth of river cane woven together by finger-sized cat briers. After ten minutes of gingerly picking their way into the depths of the growth, they stop.

The first takes a long look at the map while the second extricates a sleeve from the half-inch thorns of the last cat brier encountered. "I can see now why they call this stuff 'wait-a-minute vine.' How far does the map say we've got to go?"

It showed about 200 yards of the low marshy area.

"I think we should have gone around this place. If we'd gone due north from that last control marker we would be around this stuff by now. It would have been about a quarter mile further, but we wouldn't be ankle deep in mud and suffering from loss of blood to these cat briers."

"I suppose it would have been better to take a closer look at the obstacles between the control points before we started crashing off into the forest. We might as well keep going through here. We're about halfway through so it would be just as much work to go back as it would to go forward. Let's take a good look at the route on the next leg when we find the next control marker."

Let's allow our two orienteerers to pick, trip and slosh their way to the next control point while we examine the outdoor sport of orienteering.

Basically, orienteering is the practice of using map and compass to find one's way along a prescribed course from one designated point to another until all points have been visited. Usually, it is a timed competition. The person with the shortest elapsed time and proof of having visited all control points is the winner.

It sounds as though orienteering is a sport for those in top notch physical condition. The serious orienteerers do train daily, much as the thousands of joggers seen in city parks and on roadsides every day. Like joggers, orienteerers become as deeply involved in their sport as their time or inclination allows. On one end of the spectrum are the elite orienteerers—those who are ranked above expert—who compete in national and international meets on several courses ranging from seven to ten miles in length. On the other end of the spectrum are those who negotiate courses only as an excuse to walk through the forest, to enjoy being outdoors in out-of-the-way places and to keep their map and compass skills sharp.

The most difficult part of map reading for beginners seems to be the translation of the contour lines which represent hills and valleys, draws and ridges into the actual terrain features. After a few minutes of explanation with map in hand and the represented terrain features in view, most people have little trouble understanding the map. With practice, the map user gains confidence and can determine relative steepness and elevation differences at a glance.

The importance of this skill in orienteering will be readily apparent to our two friends who have just struggled the last few feet to the edge of the river cane to spy their next control marker about 20 yards to their north.

"Hooray! There it is just where it shows on the map." The first has protected the map all the way through the marsh.

"Yep. Right on the western edge of this cleared area. I'll punch the card and you see where we've got to go this time. And don't take us through any more swamps!" The punch makes a distinctive pattern in the card that was given them at the beginning of the course. This pattern is the shape of a triangle, though the last control marker punch made the letter "J". This is their proof that they have visited this point.

"O.K., punched here. Where to, now?"

"Well, a straight line route would be 330 degrees but don't these contour lines on that route look close together? In the instruction they said something about that. Do you remember?"

The second looks closely at the area indicated. "Yeah. That means the area is steep. We'd never make it up the hill on that side. Look how this ridge angles up from the west toward the top. See how the lines on the ridge are further apart? Less steep there." Quickly, a new azimuth or compass direction is determined. This one is 300 degrees and will bring the orienteerers to the ridge in less than 150 yards.

The two find the ridge with no difficulty. They stop to catch their breath and the first looks at the map. "How do we know exactly which direction to go from here? Do you have any idea where we are on this ridge?"

"No need. We know we're west of the hilltop where the control tower is, and we can use this ridge to point us to the hilltop all the way. See how it goes all the way up?"

Still tired from their journey through the river cane, the two walk steadily up the gradual slope for several minutes and easily find their third control marker. Interested in seeing the route they had almost taken, they both look down the steep hillside in awe.

"Whew! You were right! That's almost straight down. Can you imagine trying to come up that slope? I didn't bring any mountain climbing gear."

"Hey, we're wasting time. Where's the next control point from here?"

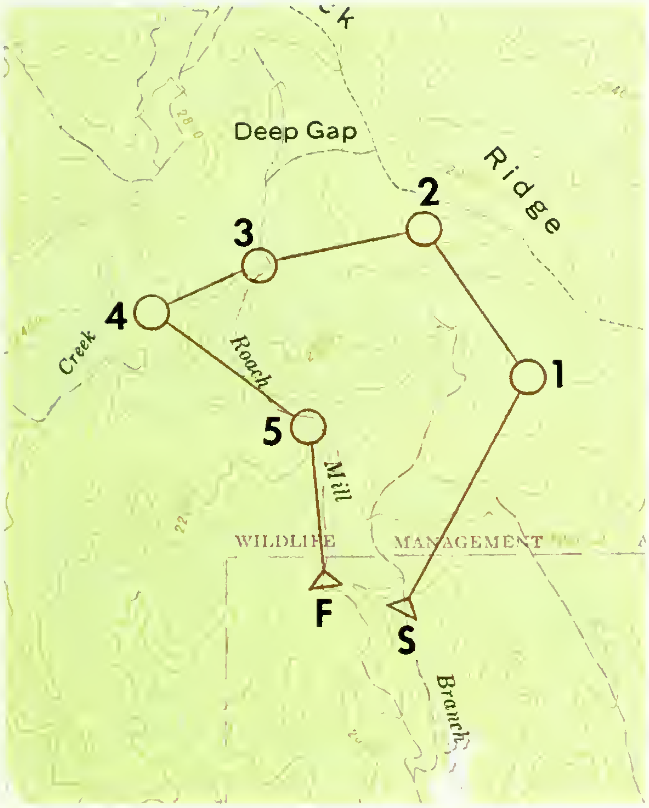
These two orienteerers chose to negotiate this course together because neither had used map and compass before. Normally, orienteerers run singly. However, this course was set up for beginners and running in pairs is not discouraged. Often, whole families will set out on a course together. They'll divide the map and compass duties so each member can contribute to finding each control point. In addition to the exercise and enjoyment of being outdoors, family members will share in the attainment of clearly defined goals.

It is not always necessary to wait for an orienteering course to be set up before taking map and compass

(At left) Participant checks updated maps and descriptions of control points before starting course.

(Left below) An azimuth (compass bearing) establishes a direction of travel.

(Below) The lines and circles on the topographic map describe a cross country orienteering course. Such a map and a compass are the basic equipment for a participant.



in hand. Once some confidence is gained, one simply needs to choose points of interest on the map and set out to locate them in succession. This is good practice and can be made as challenging as the individual wishes. Our two orienteerers have been discussing just this possibility as they pick their way to the next marker.

At this point the two approach another pair of orienteerers resting on the trunk of a downed tree. They look as though they need the rest. In the short verbal exchange, our two learn that the other two, who are on the same course, did not choose to approach the last point via the ridge but attacked the steep hillside straight on. The resting pair had started the course 20 minutes earlier than our friends. In orienteering meets the participants are started at intervals just as in a sports car rally. The elapsed time between start and finish is calculated and the orienteerer with the shortest time is declared the winner. Our two quickly move on, glowing with satisfaction that they had, indeed, made a wise decision in choosing the ridge route. As they walk, the second remarks, "It looks as though you don't have to be the fastest on foot in order to do well in orienteering—just be able to recognize obstacles on the map and choose the most efficient route."

Soon our orienteerers find their final goal before heading toward the finish of the course to check in. Checking in is important for several reasons. First, if

A measured pacing course allows participants to measure their normal stride in order to relate it to distances on the map.

they are interested in posting the best time possible, they should check in as soon as they finish, for every second counts. Second, whether they are interested in a fast time or not, they should check in to let the meet organizers know they are no longer on the course and are not lost. If they failed to check in, they would be considered lost after a few hours and a search effort would be mounted. This pair of orienteerers pays heed to the check-in point and finds that it has taken one hour and twelve minutes to negotiate the course and return with all points punched correctly. A respectable time for beginners.

Cross country orienteering like these two have just tried is not the only type map and compass exercise, though it is the most popular and usually the only type in international competitions. *Score orienteering* designates no routes and identifies all control points in the area. Each control point is given a numerical value based upon its distance from the beginning point and upon the difficulty in locating the point. The more distance and/or difficult the control point, the higher its value. Orienteerers choose the points they will visit and try to amass as much score as they can in the limited time allotted. Returning to the check-in point after the allotted time has elapsed results in penalties against the amassed score. Perhaps the most challenging of all types of orienteering is *night orienteering*. Exactly like cross country orienteering with the addition of one obvious handicap, night orienteering is for those who feel quite confident in their map and compass skills.

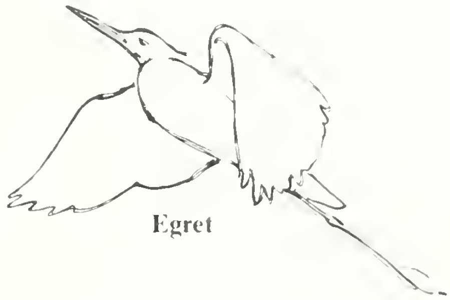
Organized efforts in orienteering are few in Georgia. Some colleges and universities offer it as part of the recreation curriculum, and most military science departments use orienteering as the fun and effective way to teach map and compass skills to prospective officers. Some outdoor stores specializing in hiking and camping offer orienteering workshops. Part of the outdoor skills taught at DNR's Blackburn Outdoor Education Center near Dahlonega include map and compass.

The next orienteering meet for beginners and intermediates will be at F. D. Roosevelt State Park on March 18-19. Instruction will be offered throughout the day. Those who are not familiar with map and compass use should be able to negotiate the beginner courses upon completion of the 2-3 hour instruction. The beginner courses will range from .75 to 1.3 miles in length. Last year, over 100 persons successfully negotiated beginner and intermediate courses at F. D. Roosevelt State Park. Most of these were beginners who graduated from the instruction offered at the park.

For more information about how to begin orienteering training, contact the Recreation and Interpretive Programming Section, Parks and Historic Sites Division, 270 Washington Street, S.W., Room 707-H, Atlanta, Georgia 30334; 656-7092.

Who knows? You might run into our two orienteering friends there.

BIRDS
Of Our Coastal Margin



Sketches and Story by Will Hon

This article just seems to be about birds. You'll see them flitting across the next several pages while we will search for threads which tie them to their coastal environments.

You are encouraged to think of birds as gourmets in search of specialized foods, as parents in quest of very particular kinds of homesteads, as migrants passing along set routes at specific times and even as loafers, lounging about in ways that are typical of their species. Each species does things in a slightly different way, thus creating for itself its unique biological niche. That is its place in the scheme of things and allows it to live side by side with many other species without undue competition. There is competition, to be sure, and many times the behavior of different species varies so subtly that the human observer may not be aware of the difference, but it is there and is responsible for the incredible diversity of birdlife on our coast.

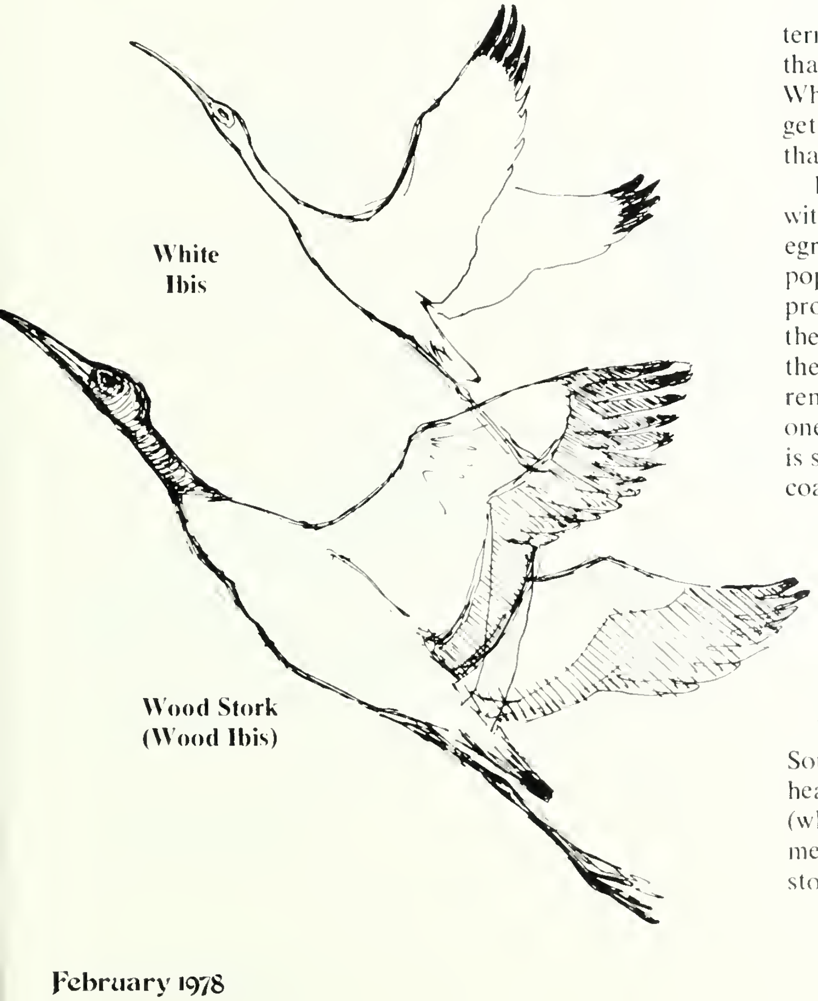
Do not, however, be fooled into amazement at the intellectual feats which seem to be involved. These are not displays of avian ingenuity or even of common sense. They are just instinctive responses in a complex behavior pattern which varies with season and situation but has firm built-in limits.

That's why we can describe bird populations with reasonable accuracy. Sometimes an individual bird will fool us . . . like the flakey flamingo that once strutted along a beach on the Outer Banks of North Carolina for a day. But typical bird behavior is so reliable that through observation you can understand the workings of their ecosystem the way you watch a football game. Weird "accidents" happen, like the deflected pass that won the 1973 Super Bowl, but you know that the rules are not going to change in the middle of the game.

Thus, when you walk up the sandy slope to a tern colony, the birds will attack you with a bravado that's as typical of the species as their black caps. When you flush a killdeer a few minutes later, you'll get a different performance: the old broken-wing act that lures you away from the eggs.

If birds do not compete with man, man does compete with birds. Now that the plume hunting trade (for egret feathers) and market hunting are no longer popular, few of the coastal species are shot. Today their problems relate to habitat destruction. Nobody wishes the birds ill, but we are in competition with them for their habitat. Each beach development or filled marsh removes a portion of the hunting or nesting grounds for one or more coastal bird species. Luckily, Georgia is still blessed with much habitat for the birds of our coastal margin.

Will Hon is a Marine Education Specialist at the University of Georgia's Marine Extension Center at Skidaway Institute.

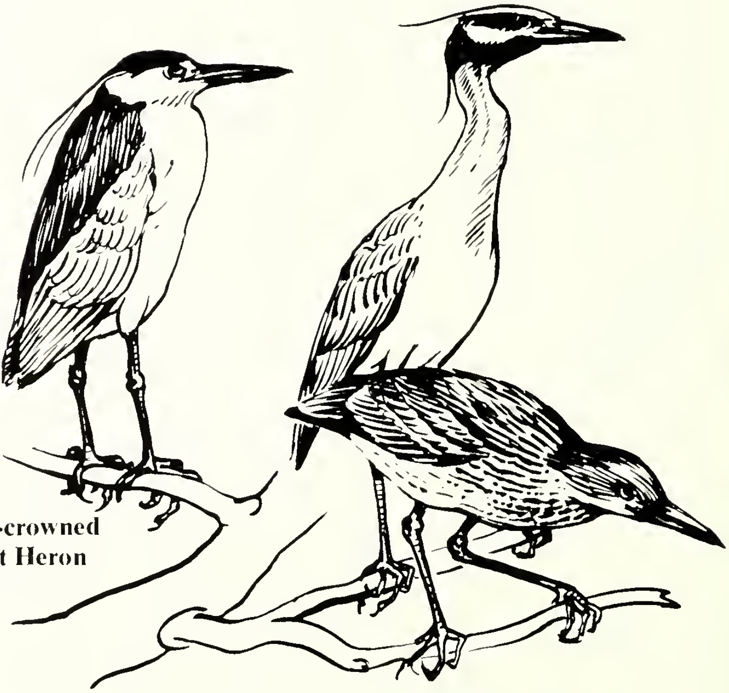


Long-necked waders are all called "cranes" on the Southeast coast. None really are. A bird which drops its head back against its shoulders in flight is a **heron** (white herons are called **egrets**). Neck outstretched means it is an ibis (top left) or **wood ibis** (really a stork, below).

Little
Blue
Heron

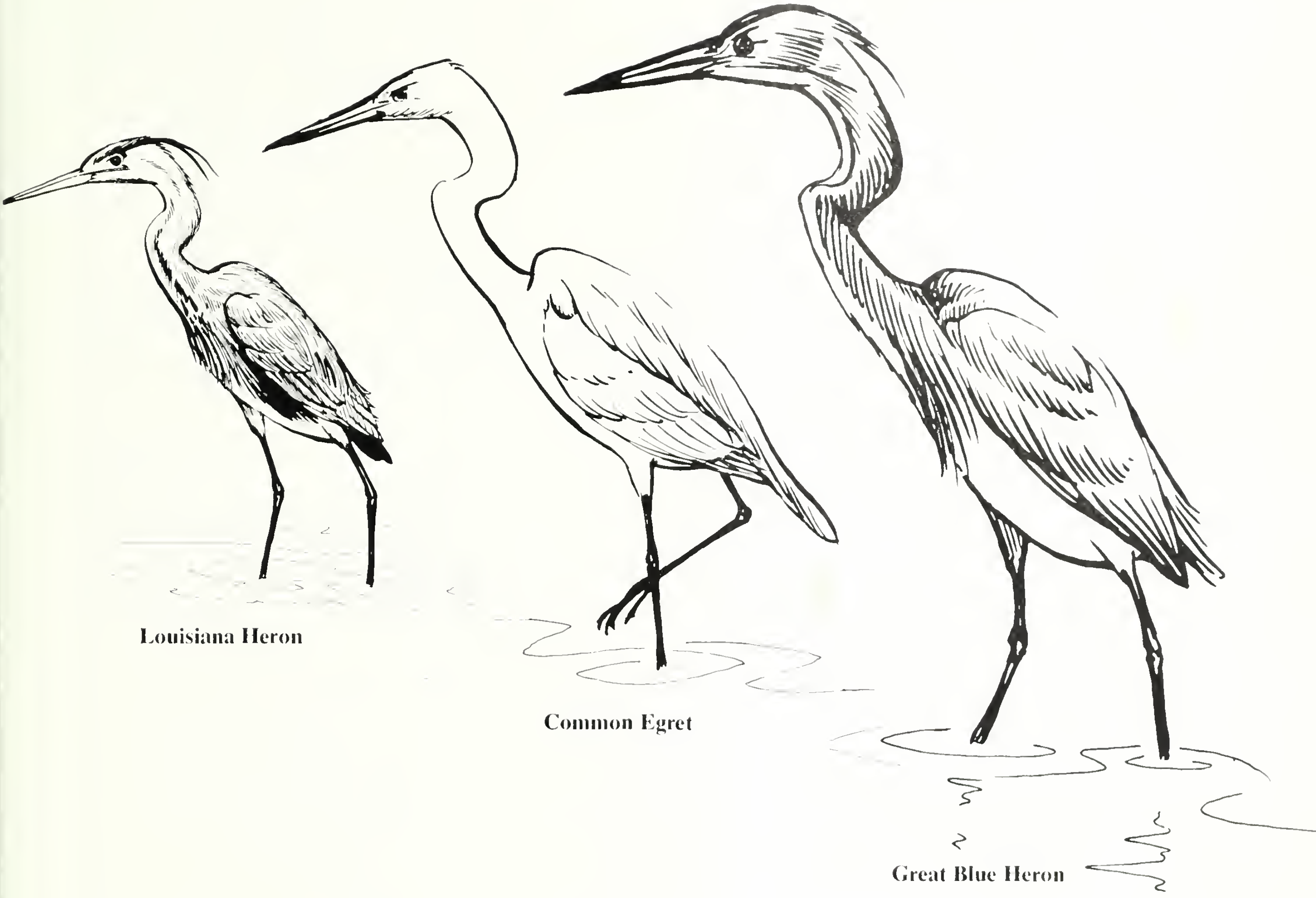
Snowy Egret

Green Heron



Black-crowned
Night Heron

Yellow-crowned
Night Heron



Louisiana Heron

Common Egret

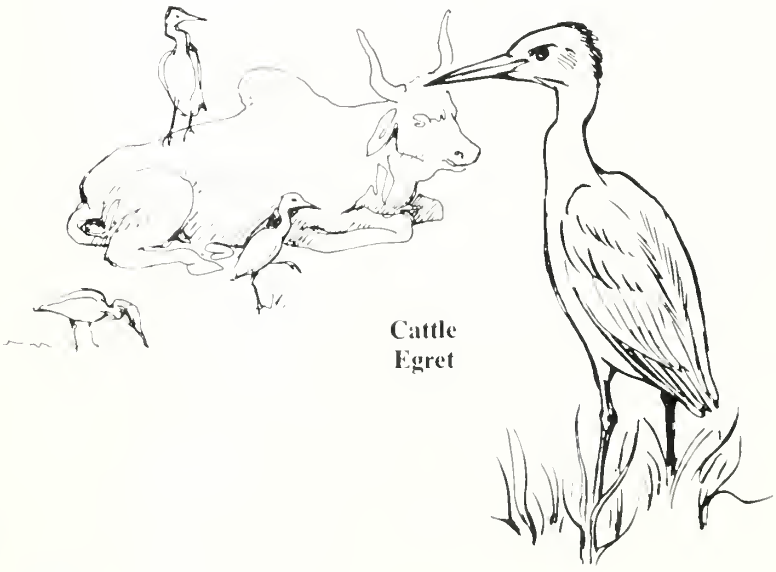
Great Blue Heron

Herons switch easily from salt to fresh water since they really don't enter the aquatic environment. They just stalk through the shallows and thrust a "spear" in from time to time to remove an unwary fish swimming near the surface.

Note the great differences in leg length and bill size. This variety of "fishing gear" lets them fish at different depths and prey on different sizes of fish. As a group, herons are thus able to cover the whole waterfront out to a depth of several feet.

All herons have a funny crook in their neck because there is a unique long bone there. This gives them leverage to fling their "spear" with increased force.

(The **cattle egret** is the surprising exception to the family. An exotic just recently arrived from Africa, it feeds on insects, often using cattle as "beaters" to flush insects into view.)

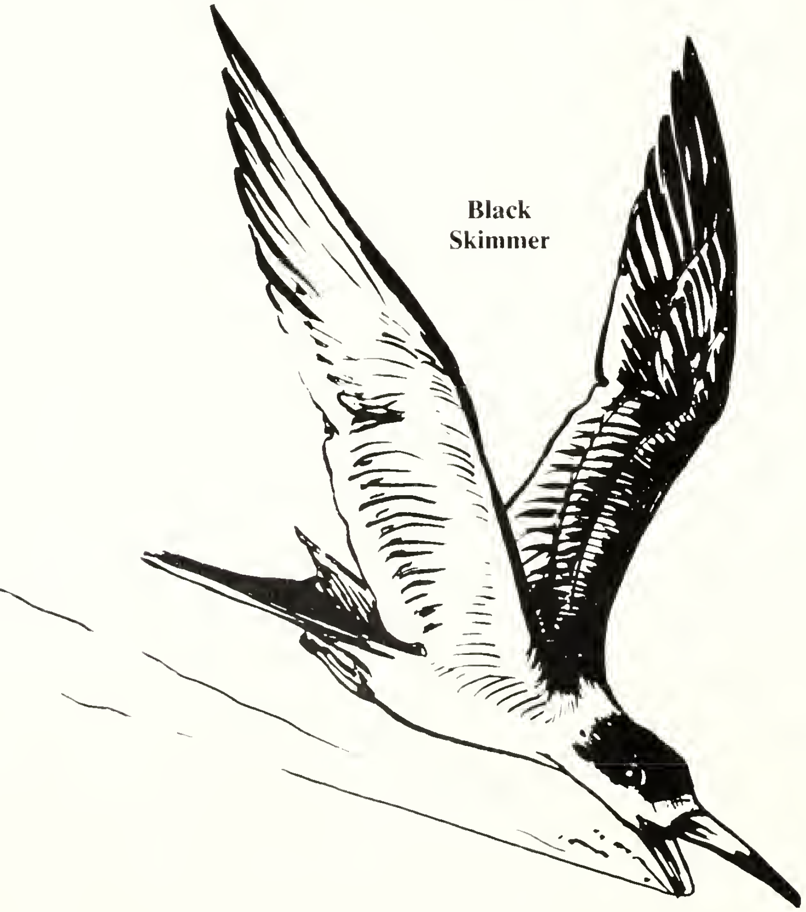


Cattle Egret

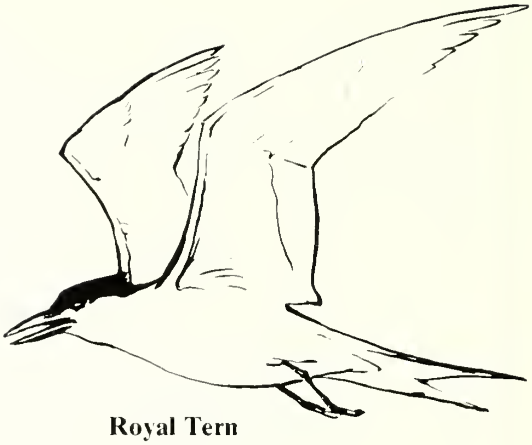
Laughing Gull

Where the water becomes too deep to wade, birds dive from above to pluck out fish. Herons aren't equipped to this, but **terns, skimmers** and **gulls** are. Sometimes gulls cheat, for they are scavengers, looking for things already dead. In the Southeast they find plenty of handouts from shrimp boats who toss overboard their left-overs.

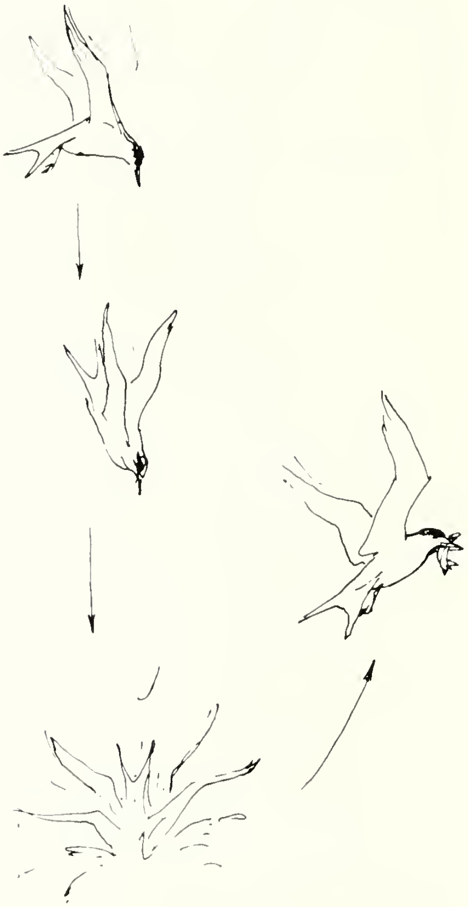
Other birds have tools and instincts for their own specialized hunting. **Terns** hover, spot a fish, fold their wings and enter the water bill-first. They often come up with a fish which may range in size from one to six inches or more. The range in sizes of terns allows them to prey on a variety of sizes of fish.



Black Skimmer



Royal Tern

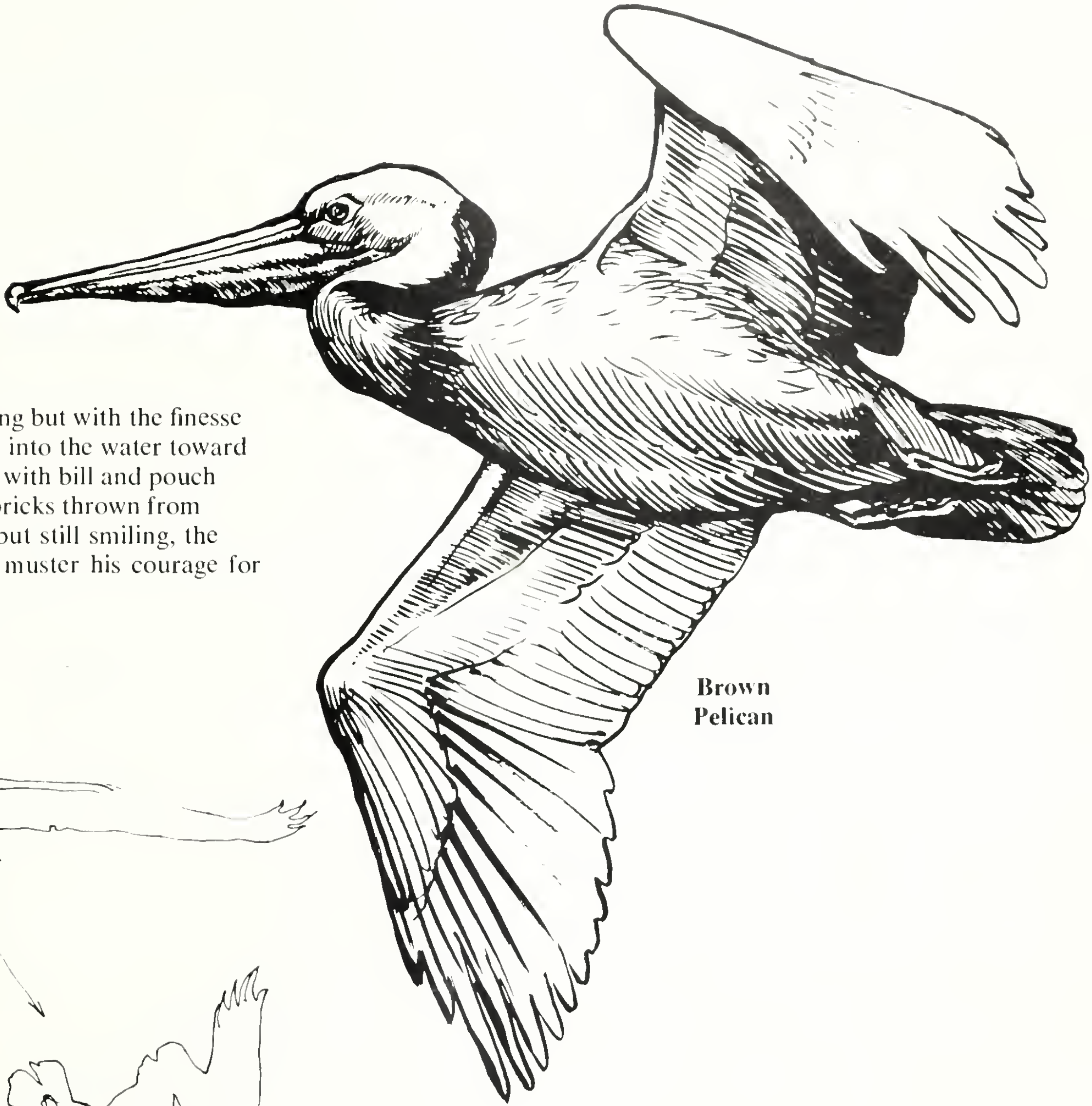


The **black skimmer** is a tern-like fisherman with a unique trolling rig. His lower bill is much longer than the upper, making it possible for him to fly along the surface with his lower bill shearing the water and occasionally luck into a minnow. A quick flip and the minnow is swallowed.

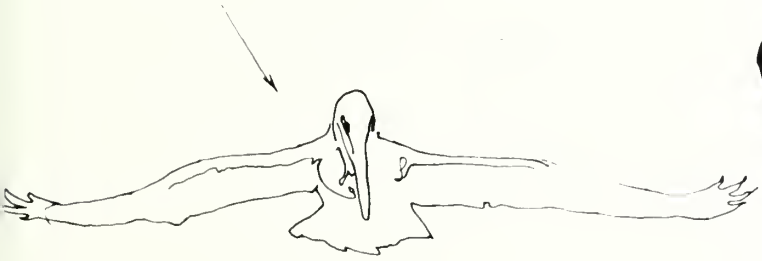
All of these are locally nesting birds which eat the available small fish in summer. Ducks and cormorants join the coastal inhabitants in winter.

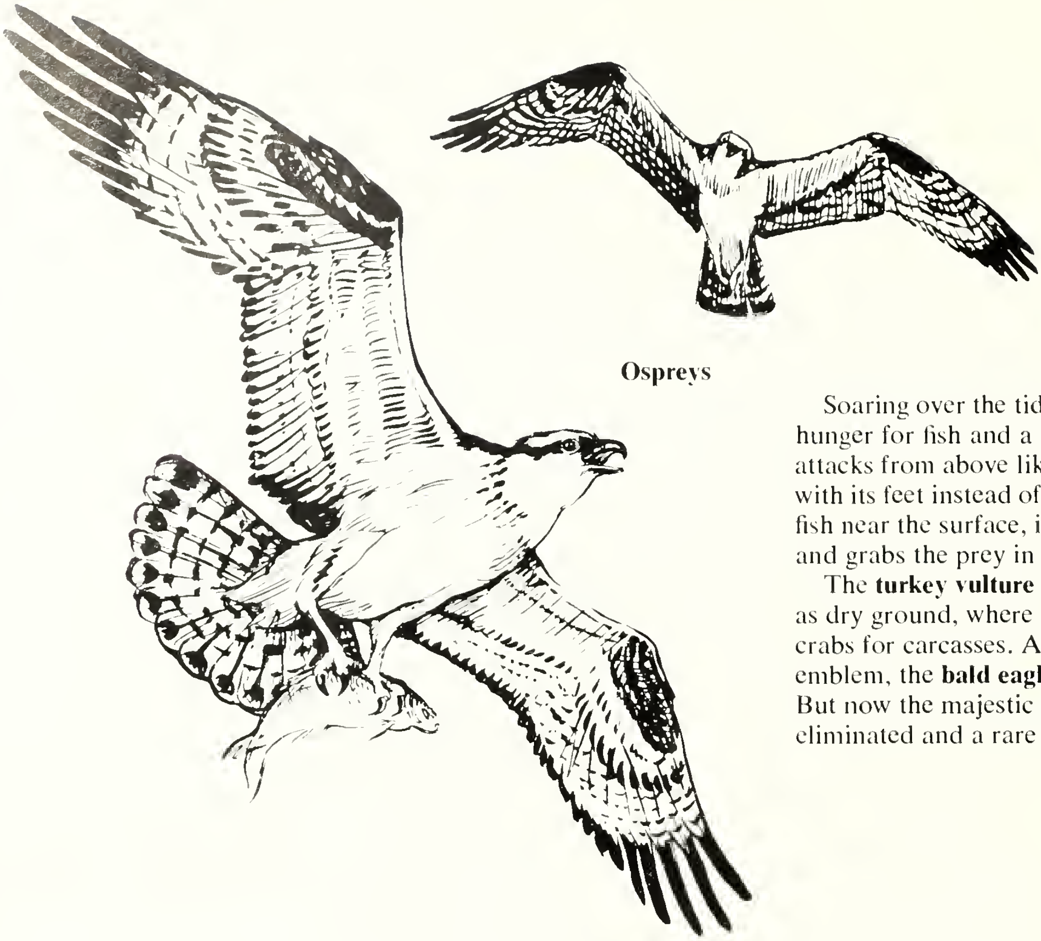
Least Tern

Pelicans do much the same thing but with the finesse of the Three Stooges. They angle into the water toward a foot-long fish, hitting the water with bill and pouch open—like a gunny sack full of bricks thrown from a dock. Stunned by the impact, but still smiling, the pelican sits awhile as though to muster his courage for another plunge.



Brown Pelican

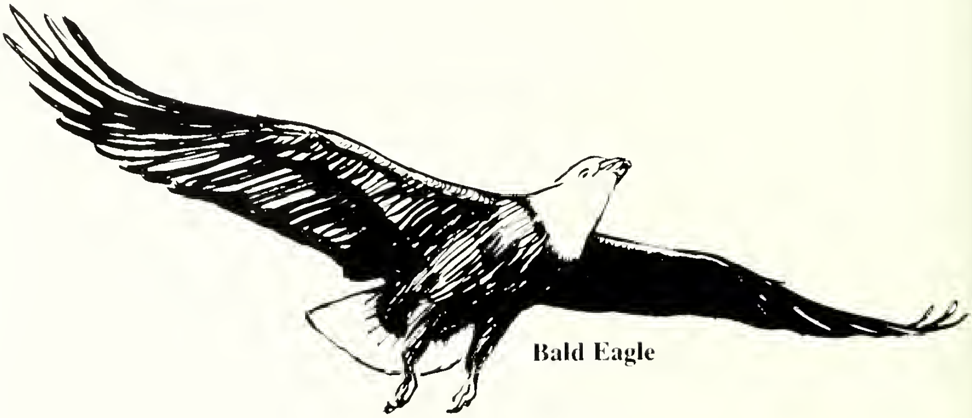




Ospreys

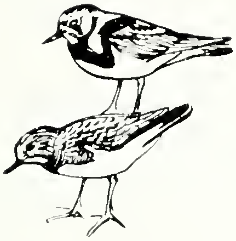
Soaring over the tidelands will be birds with a hunger for fish and a knack of getting them. The **osprey** attacks from above like terns and pelicans but leads with its feet instead of its bill. Swooping down toward a fish near the surface, it back-pedals at the last instant and grabs the prey in a flurry of spray . . . sometimes.

The **turkey vulture** can search shorelines as well as dry ground, where it competes with crows, gulls and crabs for carcasses. And, believe it or not, your national emblem, the **bald eagle,** did the same when it was here. But now the majestic garbage collector is almost eliminated and a rare treat to see.

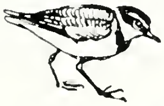


Bald Eagle

Turkey Vulture

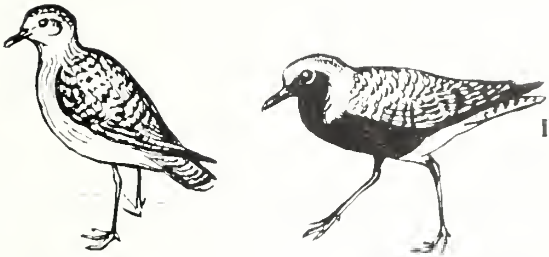


Ruddy Turnstones

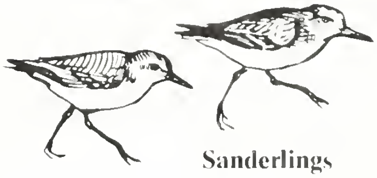


Semipalmated Plover

Wilson's Plover



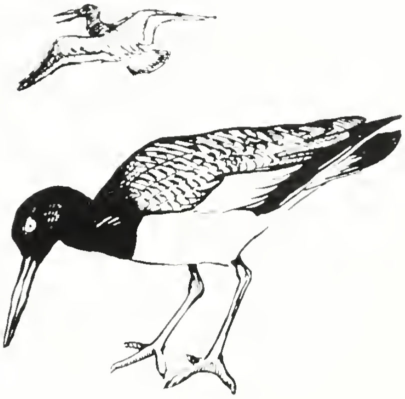
Black-bellied Plovers



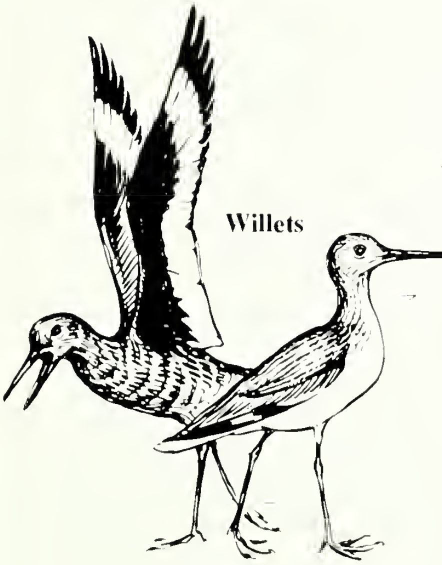
Sanderlings

A great variety of shorebirds work the tidal flats. The **oystercracker** is unique, having a stout, strong bill for unlocking oyster shells.

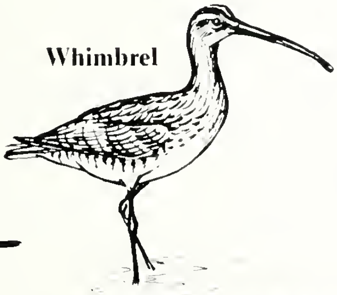
Plovers have short pigeon-like bills that probe among shells and other flotsam for small animal life. **Sandpipers,** with an incredible variety of bill lengths and curvature, fetter out tiny critters buried in the sand or mud. Variety of hunting styles makes them less competitive than they appear to be. Like ducks, they move in after nesting far to the north, to take advantage of our moderate climate and rich estuarine life.



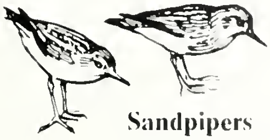
Oyster Catcher



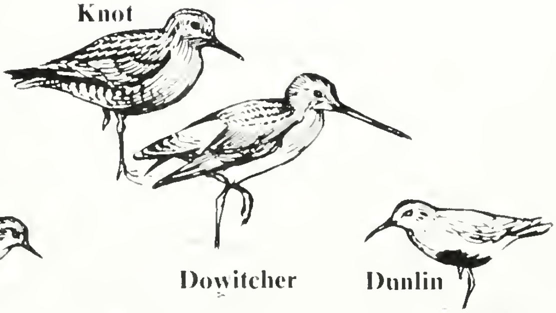
Willets



Whimbrel



Sandpipers



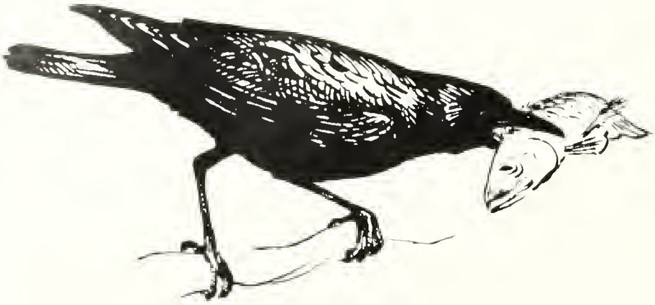
Knot

Dowitcher

Dunlin

APPROACHING THE COAST: Upland bird life with just a sprinkle of salt.

Though decidely different in geography, Georgia's coast and the uplands (or Piedmont) host remarkably similar bird species. The range of most typically land birds extends right to the ocean's edge, but the sea-loving cousins they meet there usually wander only fifty miles from their coastal home.



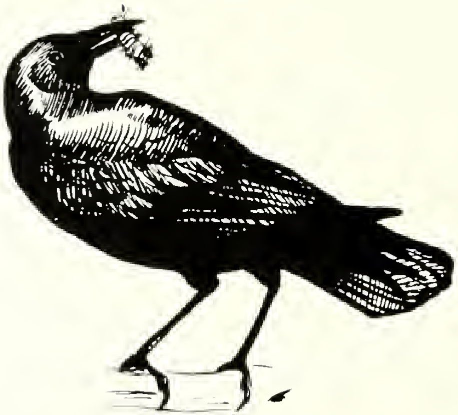
Fish Crow

The **common grackle** of upstate yards mixes along the coast with a larger waterfront character, the **boat-tailed grackle,** which boasts a great keel-shaped tail.

Common Grackle

Mourning Dove

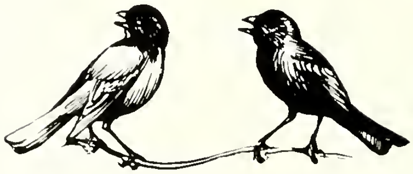
Ground Dove



Common Crow

The **common crow** finds the similar fish crow when he visits the coastal environment. The **fish crow** is a slightly smaller version of the common crow. While they look alike, the coastal cousin's hoarse, nasal call is a reliable distinction.

Boat-tailed Grackle



Painted Bunting **Indigo Bunting**

On the coast, the blue **indigo bunting** encounters an even more colorful counterpart, the **painted bunting,** a bird colorful to the point of being garish, with scarlet belly and rump, chartreuse back and bluish-purple head.

The familiar **mourning dove** blends in with the tiny stubby-tailed **ground dove** along the coast.

Planning a visit to Georgia's coast soon? Keep an eye out for these coastal birds as you stroll along ocean's edge or live-oak shaded roads.

Healan's Mill

Story and Painting by Jim Darnell

Rising out of the morning mist like some forgotten veteran of another time, Healan's Mill awakens to the dawning of another day. Located in Hall County on Whitehall Road, a short distance from Gainesville, Georgia, it has witnessed this occurrence for over a century. Throughout this time, the mill has been known by many names as it passed from one owner to another: Head, Heard, Shore, Hyde and Turner are among the better known of these. The mill is presently owned by Mr. and Mrs. Fred V. Healan.

Built prior to the Civil War by millwright Billy Head, this old grist mill has witnessed many events other than the rising and setting of the sun. Billy Head and his wife hid their gold and silver in a hollowed-out log under the huge mill wheel during the Civil War ("Yankees were commin'!").

Farmers used to come from miles around to have their corn and wheat ground here, sometimes staying overnight and returning home the following day. It was during such a stay that at least one romance blossomed at the mill.

Armor Rucker was serving with the Confederacy in Virginia when the war ended. Battles over, he walked the entire distance back to Georgia. Returning to the labors of the field, Rucker arrived one day at the mill with a load of corn to be ground. Deciding to spend the night changed his life, for it was there that he met and fell in love with Nancy Florida Head, the daughter of Billy Head. The resulting marriage produced offspring for which I am truly grateful, as this story was related to me by the great granddaughter of Billy Head—Corrence Blackstock.

On another occasion the mill must have thought it was seeing history being made right there in full view of its weathered siding. A man by the name of Williams built an airplane. He would have made history, too, but for the fact that the Wright Brothers plane flew first—and his didn't fly at all.

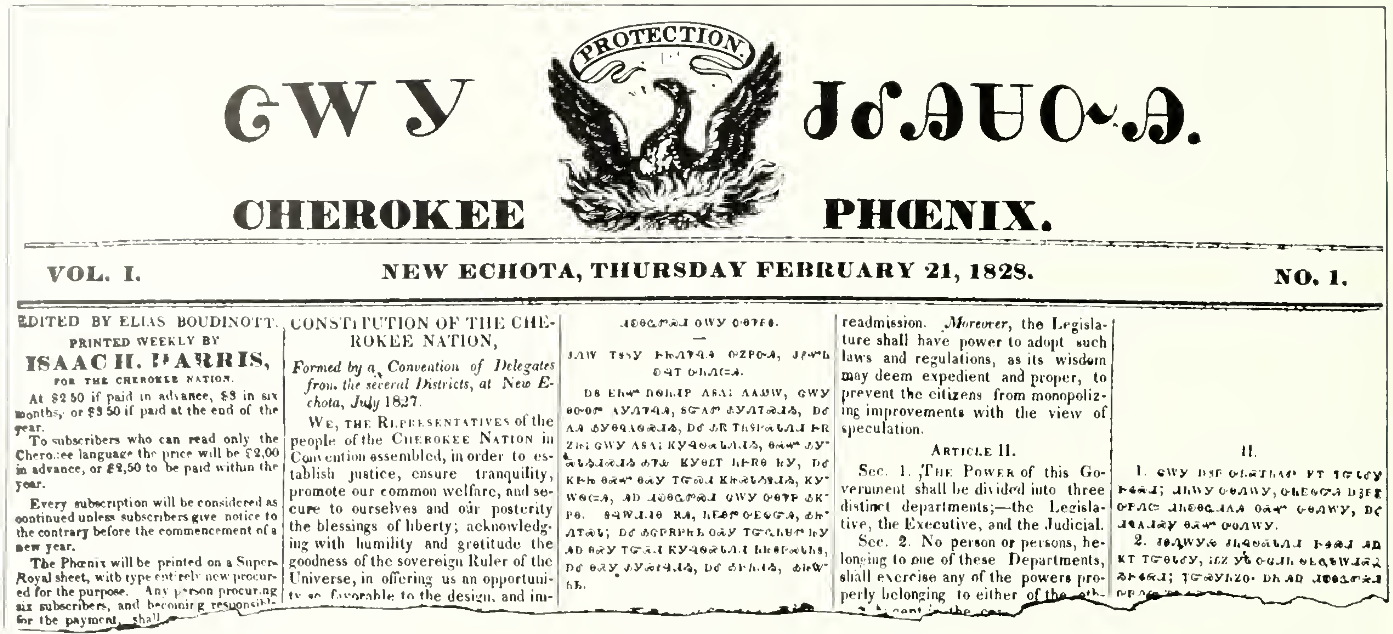
Finally there was the time Bill Minor and his "gang" decided to rob the train at Browning Crossing, a short distance away. They say the money taken was buried that night somewhere in the hills surrounding the mill, but many people have dug up those hills over the years and no money was ever found.

About the turn of the century other ventures were started at the mill site: a wine press (J. Heard), a gin (Shore), a sawmill (Hyde, operator—Braxton Carter, owner). All of these structures have long ago eroded away and only a solitary chimney, overgrown with mountain laurel, remains as a reminder of their existence.

Throughout all this time Healan's Mill has stood strong, providing services to man when called upon. Silent now that its usefulness has ended—just something to look at in passing.

Oh, for the sounds of water over the wheel, wagons rattling, and the smell of horses, harness and pipe tobacco.

James Darnell's Healan's Mill won first place in the painting category of *OIG's* 1977 Wildlife Art Show. Signed and numbered limited edition prints (20″ x 27″) of Healan's Mill are available for $35 from the artist, Route 1, Box 308, Oakwood, Georgia 30566.



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PROTECTION

CHEROKEE PHŒNIX.

VOL. I. NEW ECHOTA, THURSDAY FEBRUARY 21, 1828. NO. 1.

EDITED BY ELIAS BOUDINOTT.

PRINTED WEEKLY BY

ISAAC H. HARRIS,

FOR THE CHEROKEE NATION.

At $2 50 if paid in advance, $3 in six months, or $3 50 if paid at the end of the year.

To subscribers who can read only the Cherokee language the price will be $2,00 in advance, or $2,50 to be paid within the year.

Every subscription will be considered as continued unless subscribers give notice to the contrary before the commencement of a new year.

The Phœnix will be printed on a Super-Royal sheet, with type entirely new procured for the purpose. Any person procuring six subscribers, and becoming responsible for the payment, shall

CONSTITUTION OF THE CHEROKEE NATION,

Formed by a Convention of Delegates from the several Districts, at New Echota, July 1827.

WE, THE REPRESENTATIVES of the people of the CHEROKEE NATION in Convention assembled, in order to establish justice, ensure tranquility, promote our common welfare, and secure to ourselves and our posterity the blessings of liberty; acknowledging with humility and gratitude the goodness of the sovereign Ruler of the Universe, in offering us an opportunity so favorable to the design, and im-

readmission. *Moreover*, the Legislature shall have power to adopt such laws and regulations, as its wisdom may deem expedient and proper, to prevent the citizens from monopolizing improvements with the view of speculation.

ARTICLE II.

Sec. 1. THE POWER of this Government shall be divided into three distinct departments;—the Legislative, the Executive, and the Judicial.

Sec. 2. No person or persons, belonging to one of these Departments, shall exercise any of the powers properly belonging to either of the oth-

By Bill Hammack

On a cold February day 150 years ago in the winter-locked hills of northwest Georgia, a Cherokee Indian about 25 years old looked at the first front page of his newspaper, a paper still inky fresh from a hand press. Some of its columns were set in English, others in a brand new written language, with characters depicting the Cherokee tongue. Called *Tsa-la-gi Twi-le-he-sani-hi* (in English: *Cherokee Phoenix*), its Vol. I, No. 1 dateline reading "New Echota, Thursday, February 21, 1828," it was the first Indian language newspaper in the United States, the first Amerindian periodical in the world. The young man was the first American Indian editor. His name, as it appeared on his paper's masthead, was Elias Boudinott (or Boudinot. He had been born Galigina—The Buck—Watie, and later took the name of a benefactor, Elias Boudinot).

He gave his people a new voice that could have thundered with the full power of the press had it not been muted in infancy. An articulate man, he was a visionary who struggled to clothe his dream with the trappings of the real world, to build an ideal society for his people, a Cherokee utopia. He ultimately sought to isolate the Cherokees on a new frontier far from the influence of the white man, a frontier where they could establish a civilized Cherokee realm.

Married to a white Puritan woman he met while in a mission school in Cornwall, Connecticut, he brought Harriet back to his ancestral grounds in North Georgia near the head of the Oostanaula River. Elias, one of the best educated men in the Cherokee nation, was missionary and schoolmaster at a mission station, Hightower, supported by the American Board of Commissioners for Foreign Missions.

Elias Boudinot the Cherokee never forgot who he was. In an address from the pulpit of the First Presbyterian Church in Philadelphia in 1826, he said, "You here behold an Indian. My kindred are Indians, and my fathers sleeping in the wilderness grave—they too were Indians."

In that speech delivered on a fund-raising tour, Boudinot described the Cherokee Nation to an audience that included some listeners who had never heard of it. He told them where it was (in Georgia, Tennessee and Alabama) and how big it was (about 200 miles wide from east to west, about 120 miles deep) and about his people. "There are three things of late occurrence," he said, "which must certainly place the Cherokee Nation in a fair light, and act as powerful argument in favor of Indian improvement. First, the invention of letters. Second, the translation of the New Testament into Cherokee. And third, the organization of a government."

Properly leading Boudinot's list of these three Cherokee developments, the invention of Cherokee letters was one of the remarkable accomplishments of a century blazing with intellectual achievement. Father of the letters was a mixed-blood Cherokee, a demonstrable genius who was at first a laughingstock and later a hero to his nation, an illiterate in English, a cripple, recipient of a medal from the U.S. Congress, a drunkard who became a prohibitionist, a man who was honored botanically when a giant tree of red wood was named for him, a veteran of the War of 1812, a gifted silversmith, a man called Sequoyah. Son of a white man, he was born around 1776 in the Cherokee village of Tuskegee in Tennessee. His father's name has been subject of much debate, but it is generally conceded to have been Guess, Guist or Gist.

While his father's name has become a footnote, Sequoyah's towers like his namesake tree. He invented a system, a complete Cherokee syllabary, with 86 characters, each representing sounds out of which the words could be compounded—a system in which single letters would stand for syllables.

Grant Foreman quoted a contemporary chronicler when he wrote, "In 1821, he (Sequoyah) submitted this Cherokee syllabary to a public test by the leading men of the Nation. . . . The alphabet was soon recognized as an invaluable invention for the elevation of the tribe, and in a little over a year, thousands of hitherto illiterate Cherokees were able to read and write their own language, teaching each other in cabins or by the roadside. The whole nation became an academy for the study of the system."

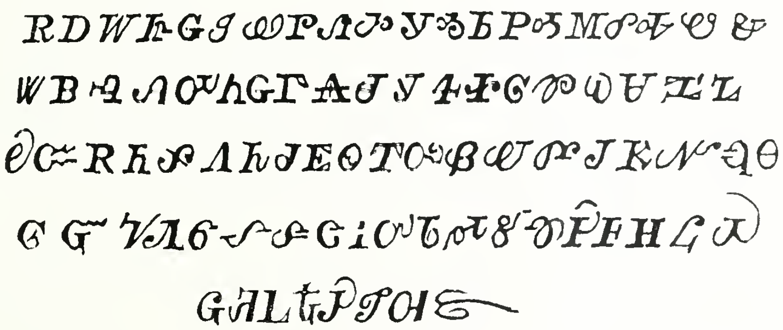
Eager to unleash the power of their written word, Cherokee champions sought a printing press and Cherokee type.

Perhaps surpassing Boudinot in pushing to establish a Cherokee press was a young Puritan missionary who arrived with his bride in the Cherokee Nation in October 1825. Behind Samuel Austin Worcester were generations of Congregational clergymen, and it seemed that he was following a preordained course when he entered Andover Theological Seminary to prepare himself for the mission field. When he brought his wife to Brainerd, a mission station near Lookout Mountain in Tennessee, he was struck by the potential of Sequoyah's syllabary. He spent nearly a fortnight with the Boudinots, studying the Cherokee language and forming a friendship with Elias. Worcester had been chosen to be

Elias Boudinot

The Cherokee syllabary, devised by Sequoyah, is an alphabet-like compilation of symbols for the various sounds used in Cherokee speech.

C.



1 A, short
2 A, broad.
3 Lah.
4 Tsee.
5 Nah.
6 Weeh.
7 Weh.
8 Leeh.
9 Neh.
10 Mooh.
11 Keeh.
12 Yeeh.
13 Seeh.
14 Clanh.
15 Ah.
16 Luh.
17 Leh.
18 Hah.
19 Woh.
20 Cloh.
21 Tah.
22 Yahn.
23 Lanh.
24 Hee.
25 Ss (sibilant.)
26 Yoh.
27 Un (French.)
28 Hoo.
29 Goh.
30 Tsoo.
31 Maugh.
32 Seh.
33 Saugh.
34 Cleegh.
35 Queegh.
36 Quegh.
37 Sah.
38 Quah.
39 Gnaugh (nasal.)
40 Kaah.
41 Tsahn.
42 Sahn.
43 Neeh.
44 Kah.
45 Taugh.
46 Keh.
47 Taah.
48 Kahn.
49 Weeh.
50 Eeh.
51 Ooh.
52 Yeh.
53 Un (French.)
54 Tun.
55 Kooh.
56 Tsoh.
57 Quooh.
58 Noo.
59 Na.
60 Loh.
61 Yu.
62 Tseh.
63 Tee.
64 Wahn.
65 Tooh.
66 Teh.
67 Tsah.
68 Un (French.)
69 Neh.
70 ——.
71 Tsooh.
72 Mah.
73 Clooh.
74 Haah.
75 Hah.
76 Meeh.
77 Clah.
78 Yah.
79 Wah.
80 Teeh.
81 Clegh.
82 Naa.
83 Quh.
84 Clah.
85 Maah.
86 Quhn.

The following characters, when put together, spell "*Friend*"—Ꭹ Ꮑ Ꮄ Ꭲ and are sounded thus—*Keeh-naa-leh-eeh.* "*Keeh*" is sounded short; "*naa*," broad;" "*leh*," short; and "*eeh*," short.

a missionary to the Cherokees because of his demonstrated intellectual capacity, and his superiors hoped that he would be able to master the native tongue, considered by some missionaries to be as difficult as Chinese to a person raised speaking English.

Worcester acquired Cherokee, oral and written, began urging the immediate establishment of a Cherokee press, and in the December 1827 issue of *The Missionary Herald,* there appeared the first printed passage in Cherokee, the first five verses of *Genesis,* translated by Dr. Worcester. Publication of the translation marked Worcester's victory: a font of Cherokee type had been cast in Boston, a font of English type had been procured, along with a printing press. Cherokees went to work to erect a building for a print shop at New Echota, capital of the Cherokee Nation.

The Cherokee government authorized spending $1,500 for the press and two type fonts, named Boudinot editor at an annual salary of $300, appointed Isaac H. Harris "principal printer" for the Cherokee Nation at $400 a year. Press and type left Boston aboard ship bound for Savannah in November 1827, were sent on to Augusta, loaded on a wagon and reached New Echota in January 1828.

Masthead of the *Cherokee Phoenix* was in Cherokee and in English, its vignette representing a rising phoenix. In his first editorial, Boudinot wrote: "We would now commit our feeble efforts to the good will and indulgence of the public . . . hoping for that happy period when all the Indian tribes of America shall arise, Phoenix-like, from the ashes, and when the terms 'Indian depredation,' 'war-whoop,' 'scalping-knife,' and the like, shall become obsolete, and forever be buried 'deep underground.' "

A perceptive historian, Hugh Awtry has called the *Phoenix* a good newspaper, serving as both the official organ of the Indian nation and a "local weekly" of sorts.

Readers were informed about Halley's Comet and elections in Virginia, they found news from England as well as reward notices, articles on better farming next to selections from *Robinson Crusoe,* the works of Washington Irving, a translation of the Parable of the Prodigal Son and a series on natural history. Boudinot reprinted informational bits and pieces from other newspapers, ran the Cherokee Constitution and Laws in serial form in Cherokee and English as an official duty, printed political announcements of candidates for National Council seats. There was a poetry corner and a lost and found column, along with notices in both languages from husbands who asserted they were not responsible for debts incurred by their wives.

The fame of the *Phoenix* rose and spread overseas. Boudinot penned slashing editorials lambasting not only settlers and adventurers who abused and took advantage of the Cherokees, but the government of Georgia as well. The Cherokee National Council urged him to tone down his attacks, but he declared that his paper was "sacred to the cause of the Indians, and the editor will feel himself especially bound, as far as his time, talents and information will permit, to render it as instructive and entertaining as possible to his brethren, and endeavor to enlist the friendly feelings and sympathies of his subscribers abroad, in favor of the aborigines."

Bill Bryant

A reconstruction of the Cherokee Phoenix *print shop at New Echota.*

As expected, considering the editor's mission education, the moral tone of the *Phoenix* was Puritanical. In a spirited effort to exorcise the demon rum, the paper was awash with stories of tragedies that befell those who succumbed to the temptations of bowl and bottle. Tobacco was blasted as well; one report was about an Englishwoman who inhaled an excessive pinch of snuff, thereupon sneezed her neck out of joint and forthwith died. The article went on to say that an autopsy revealed "four and one-half pounds of snuff in the place where her brains should be."

While Boudinot editorially denounced actions of the Georgia government which he perceived as inimical to Cherokee well-being, Georgia recognized the *Phoenix* as an official organ and often inserted notices in it. However, Georgia was on a collision course with the Cherokees, and Boudinot was aware of the trail followed by empire builders. Earlier, the Cherokees had taken the land from the Creeks, and now Georgia would take the land from the Cherokees.

"The boundary between the Cherokee Nation and Georgia was a real one," said Billy Townsend of the Parks and Historic Sites Division of Georgia's Department of Natural Resources. "Georgia's Governor Wilson Lumpkin wrote about going up into the Nation, another country, while the citizens of the Nation wrote of going down to Georgia, another domain. The existence of a large and wealthy sovereign nation within the boundaries guaranteed in 1802 vexed Georgia, and steps taken between 1832 and 1838 solved the Cherokee question, decisively."

By 1832, Boudinot had become convinced that actions by Georgia and the United States compelled the

Photos by Ed Brock

(Left) Interior of print shop with a portrait of Sequoyah over the mantel. (Below left) A printing press of a type similar to the one used on the Cherokee Phoenix. *(Below) Wood type.*

Cherokees to consider orderly and voluntary emigration, and he believed that the *Phoenix* was the proper forum for public discussion. Thereby he acquired a formidable antagonist, the Principal Chief of the Cherokees, John Ross. Ross forbade Boudinot to print a word favoring emigration and Ross wielded the power to make his injunction stick. Boudinot resigned on August 11, 1832. Elijah Hicks of New Echota, a fellow tribesman, was named editor.

Elias Boudinot kept on fighting for what he perceived to be the wisest course for his people though the majority of his brethren vigorously opposed migration. He knew that a comparative handful of Indians could not exist in defiance of both the power of Georgia and the might of the United States, but he had the confidence of a visionary that the Cherokees, on a new frontier, could establish a disciplined society where spiritual and intellectual development and secular progress were attainable goals. In December 1835 he was one of 20 Cherokees who signed the Treaty of New Echota which provided for emigration west of the Mississippi. This was a portentous event for him. Loyalty to his people, wrote Ralph Gabriel, "drove him to what his people called disloyalty."

Six years earlier, the Cherokee government had revived an old tribal law that decreed death to any individual who signed away tribal land without permission of tribal authorities. To his people, whom he loved and for whom he had fought with humankind's most powerful weapon, Elias Boudinot was a traitor. His wife suffered with him, but she did not have to endure the antipathy long. In May 1836 her seventh child, a son, was born dead. Harriet followed her stillborn baby. She is buried near New Echota.

* * *

In Cherokee mythology,
the Raven Mockers were the most
dreaded of all witches.
Flying in with the sound of rushing wind,
making hoarse cries like
those of ravens,
they would gather when an Indian
lay near death and torment
the sick one to death.
The Raven Mockers first visited the
house of Elias Boudinot
in May 1836 when the seventh Boudinot
child was born dead.
They soon claimed Harriet, too.
But the Raven Mockers weren't through
with Elias Boudinot . . .

* * *

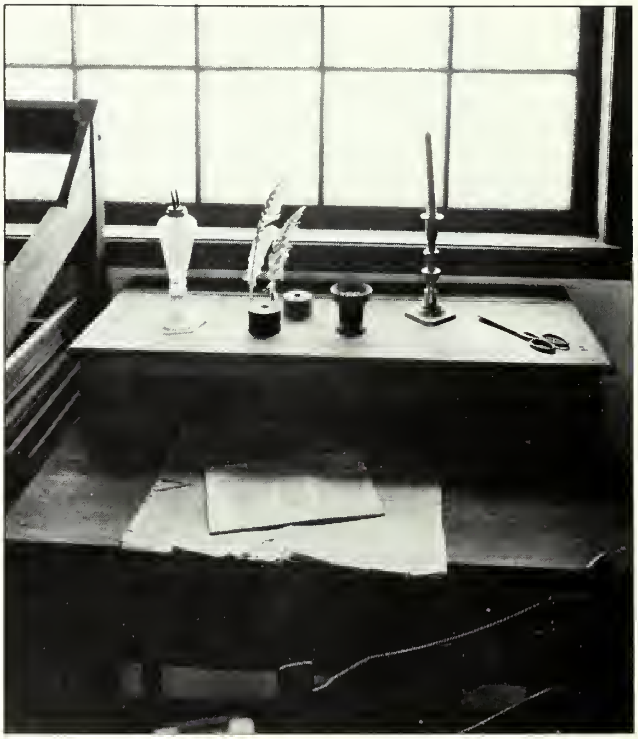
Samuel and Ann Worcester had left New Echota in the spring of 1835 to migrate westward to Indian Territory (Oklahoma). Dr. Worcester immediately established a church and a school there, took up his task of translating the Bible into Cherokee, worked on a Cherokee grammar and dictionary. Elias Boudinot and a new wife, Delight Sargent, a white missionary, and his children joined the Worcesters in the spring of 1839. Again he went to work with Dr. Worcester in their labors of translation. The Raven Mockers, however, had not finished with Elias Boudinot. In the Territory, a band of young Indians, bitter because they had been uprooted and expelled from the land of their fathers and because loved ones had been lost on the Trail of Tears from Georgia to Oklahoma, plotted his death because he had been one of the signers of the hated New Echota Treaty. On a June morning in 1839, two members of the band attacked him. One stabbed him in the back with a knife. The other smashed him in the head with a hatchet. The two young men ran into some nearby woods, joined a group of others on horseback and escaped.

Some time before Boudinot had resigned as editor of the *Phoenix*, publication had become irregular for a variety of reasons: there was difficulty in obtaining paper and printer's ink for the wilderness publication; there were accidents, such as the one that happened when the post rider fell off his horse while crossing Holly Creek and dropped the newspapers in the water where they lay on the bottom for about seven hours. And there was a honeymoon when one of Boudinot's printers, John F. Wheeler, married Nancy Watie, a sister of Boudinot's. Publication was suspended then for three consecutive issues.

The Phoenix appeared less and less frequently. Scholars generally agree that the last issue was published May 31, 1834, less than two years after Boudinot resigned as editor.

In its brief life, the Cherokee press printed 733,800 pages of the national newspaper, the Gospel, hymnals, Cherokee laws, pamphlets and broadsides. It ceased all operation in September 1835. The press, type and other equipment and related material were later seized by the Georgia Guards, a temporary police force, and have been lost.

Today, 150 years after the first issue of the *Phoenix* was printed at New Echota, a reconstructed print shop, with a press similar to the original, recalls the historic event.



By Ronald Simpson
DNR Wildlife Biologist

QUAIL MANAGEMENT

Georgia has been known for many years as the "Quail Capital of the World," this title justifiably earned by the excellent bobwhite quail *(Colinus virginianus)* population here. However, those of you who have hunted the bobwhite for a number of years may have noticed that the birds are not as abundant and that hunting is more difficult in many areas than it used to be. Statistical data gathered on hunters and their harvest bears this out. In the last 10 years the number of quail hunters has decreased by 37 percent and the statewide harvest has decreased by 55 percent. Unfavorable habitat changes account for a large portion of these declines. Restricted access by landowners has had a lesser impact on hunters and harvest than the habitat reduction. The changes in the quality and quantity of quail habitat are due mainly to urbanization, conversion of agricultural land to woodland, heavy grazing by livestock, cultivation of extensive areas, and today's "clean" farming practices such as clearing fence rows.

This statewide loss of habitat can be greatly reduced. However, it is not something that a wildlife agency can accomplish alone. The future of this top upland game bird is dependent upon land use practices of individual landowners.

There is probably as much known about the management of the bobwhite quail as there is for any upland game animal in the United States. Despite this wealth of knowledge, there is no set management formula or plan that is applicable to all areas. A given tract of land has its own character (soil fertility, drainage, amount of open land, amount of brush and forest land, major land use, etc.) and an assessment of this is needed to determine how to best increase the attractiveness of the area to quail. This is one reason many landowners have seen little increase in numbers of quail following "guesswork" management.

To assess an area's improvement needs, the entire life history of the bobwhite needs to be taken into account. Simply providing a few more seeds in winter is not the answer. The area must be developed so that the year-round requirements of the bobwhite are met. For this reason, the assistance of your nearest Game and Fish biologist should be requested.

LIFE HISTORY

The familiar "bob-bob-white" whistle which may be heard as early as February in Georgia is a signal that the breeding season is not far away. Exactly when breeding actually begins is determined by the number of daylight hours and the temperature. Coveys normally begin to break up in March, but remnant coveys may be found until early May. In March, it is not unusual for a covey to break up during the day and reform just before dark. Pairing starts at the time of the break up of the covey.

Quail are monogamous, one male mating with one female. Usually there are about 15% more roosters than hens, since there is a greater loss of hens than roosters during the year. This excess of males is nature's way of providing a mate for each hen. At hatching, sex ratios are even. The unmated males in search of a hen can be heard "bob-whiting" through the entire breeding

Clean farming and large fields result in a reduction of suitable habitat for quail.

season.

The most important months for nesting are in May, June, July and August. A few nests may be built as early as March or as late as October. Preferred nesting areas are those where ground vegetation is not a continuous dense carpet but is "clumpy" and covers about 50 percent of the total ground area. Cover of this type offers optimum screening for nests and adequate passageways for quail movement. Materials used in nest construction, primarily grasses and pine straw, are collected within a few feet of the nest site.

Quail will continue to re-nest throughout the nesting season if all previous attempts have been unsuccessful. The number of eggs laid per nest (a "clutch") decreases with each attempt: from an average of 16 eggs in April to only 9 eggs in August. There is a tremendous physical drain on a hen during nesting, especially if there are several renesting attempts.

A pair of quail will raise only one brood of chicks per year. However, it is not unusual to see chicks of different ages with an adult bird. The bobwhite, both roosters and hens, have a strong brooding instinct and will adopt strayed or orphaned young.

Studies have indicated that quail chick mortality on unmanaged land may be as high as 50 percent between hatching and 15 weeks of age. This loss can be reduced by considering the needs of young quail in habitat management. Chicks must have a diet high in protein, available only in animal matter. Management practices that produce an abundance of available insect life at or near ground level and in a protected situation will increase chick survival.

Food consumed by quail will vary with the seasons, due to the availability of food items and the quail's nutritive needs. Peak fruit consumption, for example, occurs in the late spring and summer while the greatest amount of insects are eaten in the summer and fall. The typical annual diet of a bobwhite will be comprised of 60 to 65 percent seeds, 15 to 20 percent fruits, 15 percent animal matter and 5 percent green vegetation.

Quail use cover as protection for nesting as well as feeding, roosting, loafing and escape. Cover will often serve a dual role. Feeding and loafing cover have grass and herbaceous vegetation which is generally more open or sparse than roosting and escape cover.

Excluding chicks, the greatest loss of bobwhites in Georgia occurs during either the hunting season or the breeding season. If habitat conditions on an area are good and hunter harvest is low, spring and summer losses will equal or exceed those of the winter. A population will be controlled in relation to the quality of available habitat. Summer quail production usually exceeds the ability of the habitat to support all birds through an entire year. Natural mortality from factors such as predation, disease and in some cases starvation must occur. Annual losses approach 80 percent. Studies have found that this annual loss will remain relatively constant on unhunted areas, as well as those that are hunted. Hunters therefore can harvest a substantial portion of the birds produced, 30 to 50 percent, without endangering the next year's population.

Predation and predator control in past years usually received considerable attention in quail management programs. More often than not, the controls were unjustifiable. As mentioned previously, natural mortality will maintain a bobwhite population that is balanced with what the habitat can support. Predation is simply one of nature's methods of preventing overpopulation and is usually a problem only where man has attempted to change the ecological balance. A quail population that does not exceed the habitat's carrying capacity is highly resistant to predatory pressure. Although foxes, bobcats, hawks and owls do eat an occasional quail, they may actually be beneficial to the bobwhite population. Many of the quail taken are those that are diseased or crippled. Also a large part of these predators' diets is rodents. Rodents compete with quail for food and when their population is high, they can destroy a substantial proportion of the quail nesting attempts on an area. Due to this complex balance between predators and prey species, no control of predators should be attempted without substantial reason and professional advice.

MANAGEMENT

The vast majority of the habitat improvements needed in Georgia

Quail need protective cover for nesting, but the cover must not be too dense for the chicks to move about.

will be related to increasing food availability and maintaining proper density and amounts of vegetative cover. Most unmanaged lands will usually be low in food and have cover that is either too dense or too sparse.

Quail habitat management is based on the concept of varying or diversifying the major land use types (forest, fallow or idle, pasture or grass, and cultivated land) in a manner to produce the optimum amount of food and cover. Ideal conditions are found where the land types border each other. In wildlife management, this border is called edge. A model area for quail would have small blocks of suitable brush cover mixed with small fields and small patches of woods so that protective cover is never more than a short flight away. However, rearrangement of these for maximum quail benefit is hardly feasible or economically justifiable. What must be done then is to employ practices within individual land types to approximate the "edge" effect.

There are numerous management practices and modifications that may be applied on an area but, as mentioned previously, selection of the best one and the exact implementation of it are vital to the success of the effort. The following practices are the ones most commonly used in the Southeast. Discussion of these should provide those persons interested in managing for quail some insight and knowledge of what will be involved in producing more birds.

WOODLAND

The most common and probably most beneficial management practice used in pine and low-grade hardwood stands is controlled burning. Burning removes the thick litter (pinestraw, leaves, grass, etc.) that builds up in unburned stands and stimulates the germination of the leguminous plant seeds, such as partridge pea, lespedeza, and butterfly pea. These are very important bobwhite foods in late winter and their abundance may be increased as much as 14 times in a burned area. Insects necessary for chicks after hatching are also greatly increased by burning an area. In addition, burning thins cover enough so that the insects can be found by chicks. Increased food production for adult birds and chicks is of no value if it is unavailable due to thick ground cover. Another important benefit derived from burning is creation of optimum nesting conditions the year following the burn. Areas with one year's growth of vegetation have been found to be twice as productive in terms of successful nests as areas with two years' growth and about six times more productive than areas with more than a two year growth.

February or early March is the best time to burn, but if hardwood undergrowth is dense, a burn delayed until the undergrowth begins to leaf out will assist in controlling and reducing this problem. The frequency with which a site is burned will depend on soil fertility and moisture. Average sites will probably need burning once every two years, poorer dry sites once every three years, and rich moist sites every year.

When burning an area where all ground cover is expected to be removed, selected areas of cover should be protected from the fire. Clumps of desirable shrubs, such as wild plum, hawthorn, hackberry, sassafras and blackberry 20 to 30 feet in diameter can be circled with a harrowed firebreak to provide the escape and protective cover needed immediately following the burn. Additional areas—one to two acres in size—of broomsedge, wiregrass or various other native clump type grasses suitable for nesting should be protected for early nesting attempts. Small areas, those less than one acre, have a nesting success of only one-fourth of that on larger areas. Both type areas, protective and nesting, should be burned on a regular rotation with alternate areas left unburned.

Controlled burning is not an endeavor to be tried by inexperienced persons. Precautions such as adequate firebreaks, not burning in loblolly and slash pine stands less than 10 feet tall, and timing of the burn with dryness, wind speed and direction are needed. Assistance in burning can be obtained from the Georgia Forestry Commission, as well as the Department of Natural Resources.

If a stand of timber is so dense that direct sunlight cannot reach the ground, burning alone will be of little value. Such a stand should be thinned. Food and cover plants in the developing understory vegetation will then be able to receive the sunlight necessary for growth. Soil

The clean border between the fields is generally unproductive for crops and quail alike.

When field borders and fence rows are left in brush and weeds, quail have protection access to field borders.

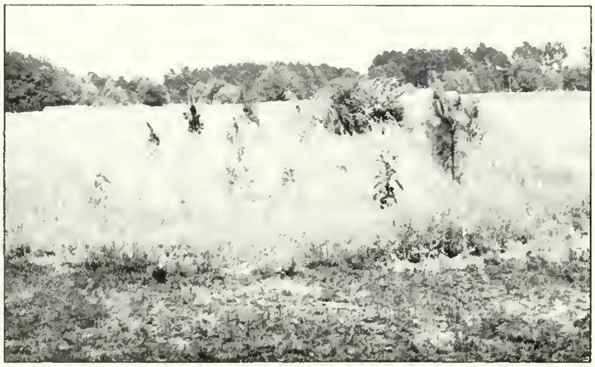
disturbance by timber operations is similar to that by disking. Seeds are scarified during this disturbance which increases germination. Thinning of overstocked timber is also a beneficial forest management practice as it releases the remaining trees from an overcrowded situation and increases their growth rate. In stands where there is a long rotation period, such as in sawtimber or pole timber, the forest canopy opened by a thinning will gradually be closed as the trees grow. Several thinnings will then be necessary during the rotation period.

Dense scrub hardwood stands are a real problem to contend with in many parts of the state. As mentioned, late spring burning will help in controlling and reducing this problem. However, mechanical means such as cutting, rotary mowing and bulldozing may be required in initial control attempts, if the sprouts are more than 1½ inches in diameter at chest height. Reduction by use of chemicals such as 2,4,5-T should be attempted only when other methods will fail and then under strict supervision since the desired vegetation as well as that undesired will be affected.

Cover and food, in addition to that resulting from burning and thinning efforts, may be provided by planting various plants recognized as valuable to quail. Some of the best food plants are cowpeas, corn, lobe lespedeza, Korean lespedeza, common lespedeza, bicolor lespedeza, large partridge pea, Florida beggarweed, brown top millet, sesbania, and hairy vetch. Areas with an abundance of summer and fall feeds but scarce in wild legumes will benefit from these plantings. Insect life, as well as seeds, are made more available to quail by many of these plantings. In fact, the quail population on some areas may actually be helped more by the insects produced and consumed by quail chicks than by the seed produced. The size of food patches should usually be one-eighth acre to one-fourth acre. Their relative value is reduced if they are too large. For example, four one-fourth acre patches will normally be of greater benefit to quail than a single one acre patch.

Bicolor lespedeza also provides protective cover in addition to food. Sericea lespedeza, wild plum and multiflora rose are other excellent cover plants. However, sericea is of no food value to quail and multiflora rose will spread in certain soil types. A minimum of one cover area, 20 to 30 feet in diameter of planted or natural plants, should be developed for every 10 acres of managed land.

Quality hardwood stands, where burning is excluded, can be developed to produce more quail by thinnings and creation of small openings. They should be about one-half acre in size and planted in food plants such as Clemson combine pea and partridge pea. A border strip of sericea or bicolor lespedeza about 15 feet wide can be added for cover. Again, the dictates of the land will determine the number and distribution of these.



Brushy runaways into the field itself provide even more opportunities for quail utilization. Unmowed terraces and temporary field separations can provide this with little loss of production.

PASTURE AND CULTIVATED LAND

Pasture and cropland nearly always lack adequate cover for quail. This is due to heavy grazing by livestock and "clean" farming practices. Heavily grazed areas and certain row crops such as cotton and tobacco also provide little in the way of quail food.

Open pasture and cropland can be made more suitable by allowing field borders or existing fence rows to revert to natural vegetation and developing scattered thickets or islands of woody cover and cover lanes across these areas for protection. The cover lanes and thickets allow quail access to a greater portion of the open areas as they normally will not use the middle of even a 20 acre pasture or field, only the edges where there is cover. The more an open area can be broken up, the better it is for quail. However, the extent to which the thickets and hedgerows may be used on an area must be decided upon by their compatibility with the farming operation and degree of management wanted.

On cultivated land, a hedgerow or cover lane can simply be a strip about 15 feet wide which is left out of cultivation. Permanent lanes can be established by leaving the same strip uncultivated for a few years. Grass, shrub and tree species usually need only 3 to 5 years to become established. If more rapid development and results are desired, these strips can be planted to pine with clumps of plums, etc., at regular intervals. Where cultivated land is bordered by woodland, a 15 to 20 feet wide transition strip can be left between the two. It can be left to revert naturally to desirable species such as beggarweed and ragweed, or it can be planted. Sericea or bicolor lespedeza are two of the perennial species that can be established between woodland and cultivated land. Wild plums, if transplanted to form a brush area approximately 25 feet in diameter every 150 yards or so in the transition zone, are very desirable. Except for the desired protective cover, the area should be burned at the same time as the bordering woodland and the soil periodically disturbed by disking.

Where cultivation methods prohibit use of cover lanes, woody thickets may be used to provide permanent cover in field areas. They can be simply a small area 25 to 30 feet in diameter of oaks, sassafras, etc., left out of cultivation. Such thickets should be located so that they are a relatively short flying distance from the nearest cover, whether it be another thicket, a cover lane, or field border.

There are two main types of pastures to contend with, permanent and temporary. Permanent pastures can be either improved or unimproved. Whether or not an improved pasture is of value to quail will depend on its size, degree of grazing, and use of herbicides in controlling weedy growth. There are several ways of increasing the use of these areas by quail. Moderate grazing will leave adequate nesting cover. Delayed mowing of these pastures until the latter part of June will also increase nesting success. Common lespedeza, if used as part of the pasture mixture, will provide some seeds. Bahia grass, used in many pastures, also provides summer and fall seeds for quail.

Unimproved pastures are generally more suitable for quail than improved as they have more weedy and woody growth. Summer and winter use to quail depends on the amount of grazing. Practices used on improved pastures are of benefit on this type also.

Temporary pastures are generally rotated annually and are overgrazed leaving little in the way of food and cover for quail. Thicket areas, hedge row, and food plots can somewhat increase their attractiveness.

The thickets and hedgerows in pastures should be composed of plants that are seldom grazed by cattle such as wild plum and hawthorn. These plants will protect some quail food plants from grazing as well as providing cover. Fencing of cover lanes, which can be gully areas or other low productive areas and food patches, is a productive practice but it is costly. However, it will be necessary to fence if certain food plants toxic to livestock are used. None of these are recommended here. Domestic annual plants that can be used in patches and that produce an abundance of quail food are cowpeas, millets, soybeans, Korean lespedeza and corn. Certain varieties of sorghum may also be used but the attraction of large numbers of blackbirds to these greatly reduce their benefit to quail. If food patches are used they should be rotated with fallow patches being replanted every other year.

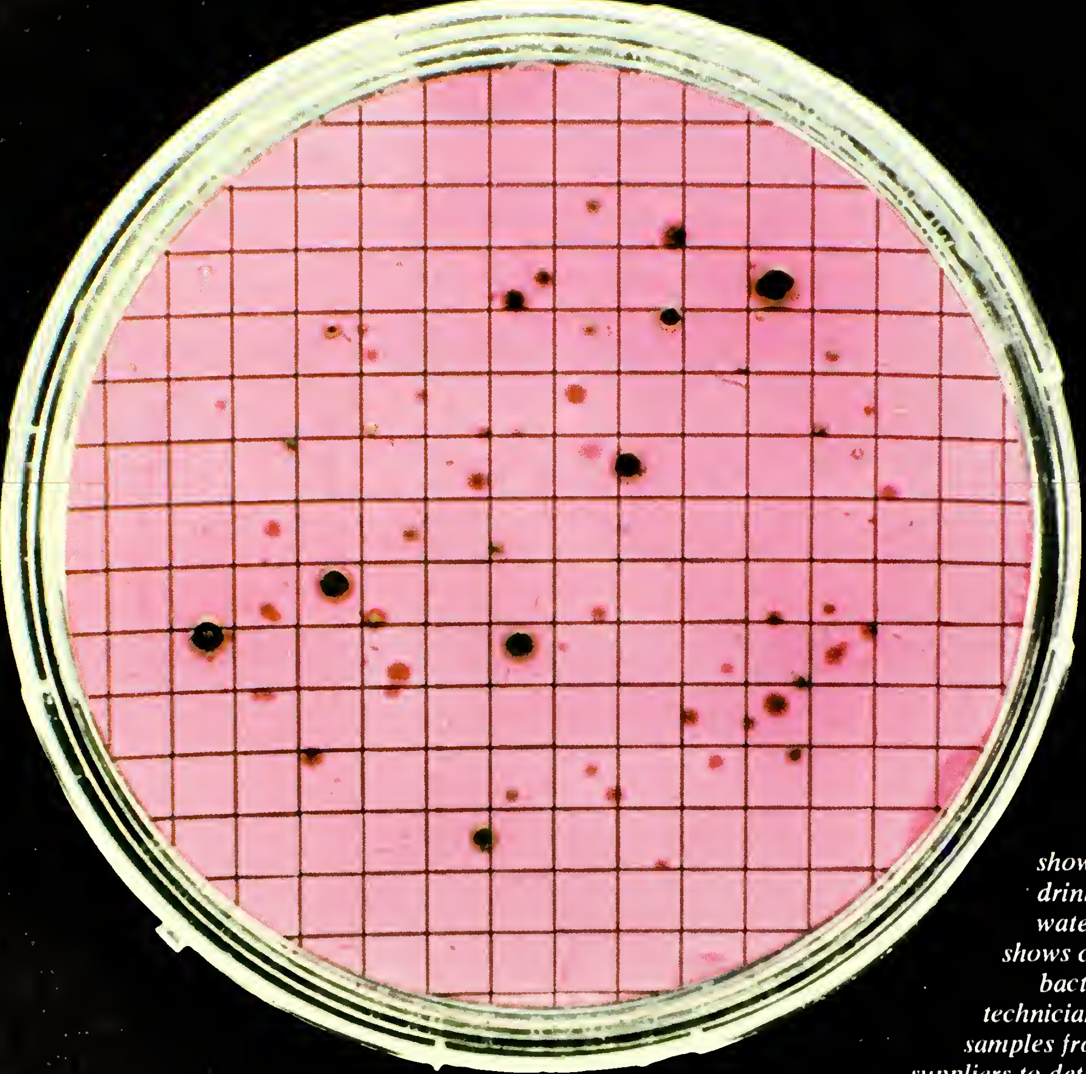
FALLOW OR IDLE LAND

Idle fields do not have an abundance of wild legumes until about the third year they are left out of cultivation. This abundance remains at a peak until about the tenth year. Such areas should be control burned when grass and other herbaceous ground cover is dense enough to carry a fire. This will maintain the development of the plant community on an area at a stage that is optimum for quail.

Fire is one of the best quail management techniques in pine stands. Prescribed burns must be planned carefully for best results and to avoid damage.

H_2O

Safe To Drink?



This slide shows what you may be drinking in that glass of water. The enlargement shows colonies of coliform bacteria in water. DNR technicians (right) test water samples from the state's water suppliers to determine if maximum contaminant levels of coliform bacteria and a variety of other pollutants are being exceeded.

Clear, cool, bubbling water. Too often, we take this vital natural resource for granted and abuse it with gross industrial and residential waste and careless litter and discharge. When polluted, water becomes ugly, smelly and distasteful; even worse, it endangers public health. Federal and state laws today regulate our drinking water, providing maximum toleration levels for a variety of pollutants which enter our water resources.

SAFE WATER:

A HISTORICAL PERSPECTIVE

Purifying water for human consumption is not unique to our generation. From the beginning of man's civilization, various methods of cleansing water have been employed. As far back as 2000 B.C., inhabitants of India heated, boiled and exposed water to sunlight; then they dipped it repeatedly into copper vessels and finally filtered it into earthen vessels. Here in America, following the installation of the first piped (conduit) water system in Boston in 1652, population growth forced citizens to take a closer look at the importance of a safe water system. Filtration was discovered as a method of removing bacteria in 1885. After a cholera epidemic in Hamburg, Germany in 1892, people there became very concerned about water purification. Citizens who drank unfiltered water from the Elbe contacted cholera while people across the river who drank filtered water remained healthy.

Ed Brock

In 1872, the first successful U.S. filters were used in Poughkeepsie, New York. Liquid chlorine was applied to water as a means of destroying disease-producing bacteria in 1912. Today, nearly every large city chlorinates its water.

Water analysis became an increasingly important means of insuring public health in the early 1900s. Georgia first got interested in 1941 when the State Health Department made laboratory studies of water samples. In 1924, the State Board of Health established a Sanitary Engineering section to analyze water. Four years later, the State Board of Health adopted rules and regulations on safe drinking water, but it was not until 1949 that the first comprehensive laws were passed. Fortunately, since the beginning of water analysis, Georgia has experienced only two outbreaks of water-borne diseases—dysentery following a public septic tank breakdown and subsequent sewage contamination in 1928 and typhoid fever in an Albany cotton mill and a LaFayette school in the late 1930s.

CURRENT LEGISLATION

No significant strides were made in safe water regulation and analysis between 1949 and 1970. However, the 1970s marked a progressive change in Georgia's safe water program. As a result of Georgia's rapid urban growth, DNR's Environmental Protection Division now directly supervises and regulates water supplies for 4.25 million Georgians. Only 750,000 Georgians remain on individual water supply systems.

Passed in December 1974, the federal Safe Drinking Water Act gave the state a choice of changing the public safe drinking water rules or allowing the federal government jurisdiction over their regulation. The state assumed the responsibility to regulate safe water. Almost two years ago, the state, through EPD, began to implement a joint program with local governments that would assure all Georgians safe public drinking water.

In announcing the program, Governor George Busbee emphasized the importance of drinking water regulation. "In recent years many organic chemicals have been developed and utilized widely in our society which are ending up in varying concentrations in our drinking water. Since various organic chemicals are known to accumulate in the body and create adverse health hazards which in some cases have been shown to be cancer-causing, it is imperative that the state implement an adequate program to check all public water systems and conduct the necessary laboratory testing."

Busbee believed that the state should safeguard the public's drinking water with the least amount of federal intervention. Under his direction, the General Assembly last year passed the Georgia Safe Drinking Water Act of 1977, while the Board of Natural Resources adopted the Safe Drinking Water Rules that had been drawn up by EPD.

DETAILS

The new state standards for safe drinking water, which mandate definitive purification measures, are obviously intended to safeguard public health—to make sure we are not risking our health by drinking water from our faucets.

The water purification cycle as now used by surface water suppliers employs four basic steps: feeding, mixing, filtering and eliminating. Chemicals are mixed into water systems to destroy water-borne bacteria and eliminate bad odors and tastes. Once this step is completed, impurities must be allowed to settle out.

Sand filtering removes any remaining impurities, and a chlorine treatment kills bacteria which could have survived the regular treatment process.

Ground water (water from wells or springs) requires less treatment than surface water (lakes, streams, rivers, etc.) because the ground itself serves as a filter as water passes through its gravelly, sandy composition. Sometimes only chlorine, softening agents and odor and taste eliminators are needed to purify ground water.

According to the new state rules, a public water system provides piped water for human consumption to a minimum of 25 persons daily or to 15 service connections at least 60 days out of the year. Public water systems are further classified as: (1) community systems—full-time residential systems, serving at least 25 year-round residents or providing a minimum of 15 service connections used by year-round residents; (2) non-community systems serving customers such as restaurants, hotels, campgrounds and some schools, factories and churches.

Before developing, expanding or installing a public water system, a water supplier must submit detailed plans and specifications of the supply source, method of treatment, storage, and distribution to EPD for approval and a permit to operate. Four EPD regional offices are primarily responsible for surveillance of ground water systems—Albany, Atlanta, Macon and Brunswick. Engineers approve plans submitted by water suppliers, investigate their compliance with water standards, and inspect water systems during and after construction. Periodically, water plants are surveyed to assure compliance with requirements. EPD personnel also help train local water system operators, work with water suppliers who have problems and check to see if public water systems meet state requirements.

State law now requires a permit, which must be obtained from EPD, to operate any public water system. The EPD Director may issue public notices and hold public hearings

A typical water pollution control plant for treating municipal sewage bearing water. Water treated at this facility will be suitable for release into the environment.

This bypass channel carries treated waste water back to the stream.

Bob Troxler

whenever he deems that such action is necessary prior to the decision to grant or deny a permit. Permits are issued for a fixed term not to exceed 10 years and may include terms, conditions, and schedules of compliance to fulfill the requirements.

In larger systems where the population exceeds 10,000, surface and ground water suppliers must have a microbiological lab, and samples must be tested for bacterial contamination. All laboratories must be certified; otherwise, their sample analyses are considered invalid. Samples are sent to the EPD laboratory every month. Non-community systems are required to send samples at least quarterly.

MAXIMUM CONTAMINANT LEVELS

Laboratory testing determines if water samples exceed maximum contamination levels of a variety of pollutants. Primary maximum contaminant levels (MCLs) have been established for 10 inorganic chemicals: arsenic, barium, cadmium, chromium, lead, mercury, nitrate, selenium, silver and fluoride; for six pesticide-related organic chemicals; for turbidity; for coliform bacteria; and for radioactivity. Secondary MCLs are set for nine chemical substances which are not known health hazards but will cause offense to the senses of sight, smell and taste.

According to Robert Byers, program manager of EPD's Surface Water Program, safe drinking water is "water that is free from contaminants that would affect the health of individuals." Gene Welsh, chief of the Water Protection Branch, explained the hazards posed by unsafe drinking water. "In the case of an accidental spill, some contaminants may be tolerated in the parts per billion range for a day or so, with minor risks. However, over a lifetime, only a fractional part per billion of these contaminants can be tolerated without undue risk to the public health."

Water samples from public water systems are sent to EPD's laboratory not only for analysis, but for resampling whenever an MCL is exceeded.

Water suppliers must report to EPD within 48 hours if they fail to comply with any primary drinking water rules or if they cannot meet water monitoring requirements.

If a community water supplier fails to fulfill requirements—after issuance of a variance or exemption—or fails to perform any required monitoring they are required to notify their customers of this either with the next water bill or by written notice within three months. Notification must be repeated at least once every three months as long as the system fails to comply. Failure to monitor water standards, failure to meet a maximum contaminant level, or failure to comply with the public notification requirements all constitute violations of Georgia's Safe Drinking Water Act. Failure to comply with state regulations will cost a water supplier more than just loss of customer satisfaction—civil penalties can run as high as $5000 for each day the violation continues.

When unsafe water in any locale creates an imminent hazard to the public health, safety or welfare, the EPD director can order immediate action taken and can specify the time and place for a hearing within 20 days. This is a giant step toward assuring safe public drinking water to the citizens of the state of Georgia.

The public must realize that water is a precious element essential for human survival. Georgians are now assured a better chance to receive healthy, clean and disease-free water. Yet, in the final analysis, that assurance is contingent upon each water supplier's responsiveness to and responsibleness for the safe drinking water provisions.

Persons desiring additional information about the law and rules should write or call EPD's Water Supply Section, 270 Washington Street, Room 825, Atlanta, Georgia 30334; (404) 656-4807.

An activated sludge chamber assists in the aeration of waste water. This provides oxygen for aerobic digestion of sewage pollutants.

Bob Troxler

Ron Snuggs

Bill Bryant

Ron Snuggs

Bill Bryant

Crafts at Unicoi

By Susan K. Wood

Nestled among the mountains of North Georgia, Unicoi in the stillness of winter is envisioned as a quiet, get-away-from-it-all kind of place.

But if you head for Unicoi State Park the weekend of February 18-19, don't plan on the peace and quiet of an isolated mountain retreat. Unicoi's planned programs go on year-round, and February 18 marks the beginning of probably the biggest festival the park hosts. The Third Annual Fireside Craft/Art Show, to be held the third weekend in February at Unicoi's lodge, is expected to attract thousands.

"Last year over 5,000 people came here for the two-day show," Ron Snuggs, Interpretive Program Chief at Unicoi, proudly explains, "and that makes it probably the most well-attended activity we hold here at Unicoi. It's even more popular than our Appalachian Music Feast held in August."

Forty-seven of the Southeast's most talented artists and craftsmen will transform the lower level of Unicoi's lodge into a county fair of traditional as well as modern Southern crafts and artwork.

In addition to the variety of paintings, sketches, macrame, pottery, quilting, stained glass and handmade dolls, visitors to the show can see and buy some most unusual craft items.

Margaret Owens of nearby Cleveland carves applehead dolls, dresses them in handmade costumes and—voila—instant caricature. She's made overalled farmers with pitchforks, churning grandmas, children, banjo pickers, anything your imagination can dream up. Her elaborate appleheads are an adaptation of an age-old pastime, the results of which were, undoubtedly, vastly different from Margaret Owens' dolls.

Xavier Roberts, who runs Unicoi's tiny craft shop located in the lodge, will be showing his unusual stuffed "dolls" which have won ribbons in shows all over the Southeast, including first place in originality from the Walt Disney World show held last October.

Many of the artists who'll be at the Fireside Craft/Art Show also display work at Unicoi's craft shop. Debbie Morehead's paintings and drawings—most of which depict the North Georgia landscape—are there, as are Ethel Hogshed's wood carvings, and beautiful quilts made by several North Georgia ladies.

Craft demonstrations and a warm fire in the big fireplace will set the scene for the weekend in the North Georgia mountains.

Unicoi is probably one of Georgia's most popular and best-known state parks. Ron Snuggs and his staff plan activities throughout the year for visitors to take advantage of if they desire. Unicoi's interpretive programs have become popular with Georgians and out-of-staters, too. Of course the fall season brings thousands of people to Unicoi, but the park is beautiful even through the winter, especially if a blanket of snow happens to turn it into a winter wonderland.

"We started the Fireside Craft/Art Show a couple of years ago to try to bring people up here in the off season. People don't seem to realize parks are open all year round. So we started this show in February and our Square Dancing Weekend in January, and both of them have really caught on. People have found out how nice it is in the mountains in winter, and they have started coming back year after year. And we have the perfect place to stay here at Unicoi: 20 cabins, 103 campsites and a 60-room lodge with big fireplaces, good food and lots to do."

Unicoi is located on Highway 356 just north of Helen. So make plans now to attend Unicoi's Fireside Craft and Art Show, set for February 18-19. There is no charge. Hours for the show are 10 to 6 both Saturday and Sunday. A warm, blazing fire and friendly faces will welcome you.